CSCAPE 2005: NOAA Ship David Starr Jordan
Weekly Science Report – Leg 7
30 November 2005
Jessica Redfern, Cruise Leader

Science Summary: 24 November – 30 November, 2005

Our week began on a beautiful Thanksgiving Day. We enjoyed sunny skies and calm seas as we passed through mixed schools of short-beaked common and striped dolphins. Throughout the day, wonderful smells wafted throughout the ship. The heroes of the day were our phenomenal cooks, Angelito Llena and Mike Sapien. They prepared a full turkey-day feast and it was wonderful!

Our Thanksgiving Day feast was amazing. We can't thank Mike and Lito enough for all of their hard work!

Overnight, conditions changed dramatically and we spent Saturday and Sunday dealing with that infamous CSCAPE weather. Winds blew 25-30knots, closing down our cetacean survey efforts. Of course, very little can stop our intrepid birders and oceanographers; make sure to check out both sections for more details about their adventures this week.

The winds died down Monday and it felt good to be back on full survey effort. We picked up where we had left off with mixed species dolphin schools. They remained our staples for the rest of the week. With so many sightings of short-beaked common dolphins, we've been able to appreciate differences among their color patterns. Check out the photo-id section for more details. Other sightings this week included Risso's dolphins, a blue whale, fin whales, and a lone sperm whale.

Sightings and Effort Summary for Marine Mammals

Date	Start Stop	Position	Distance	Average Beaufort
112405	655	N34:14.35 W123:25.35	55.0 nmi	3.4
	1513	N34:31.63 W124:42.90		
112505	741	N35:51.18 W124:28.85	13.2 nmi	5.7
	950	N35:32.26 W124:35.18		
112605			0.0 nmi	6
112705	751	N35:09.14 W124:42.65	69.4 nmi	4.3
	1709	N33:48.83 W125:05.10		
112805	705	N33:08.64 W125:21.69	65.3 nmi	2.5
	1709	N31:56.65 W125:46.08		
112905	701	N31:27.13 W124:17.17	91.6 nmi	3.1
	1703	N32:59.72 W123:47.40		

CODE	SPECIES	TOT#
13	Stenella coeruleoalba	8
17	Delphinus delphis	17
21	Grampus griseus	1
46	Physeter macrocephalus	1
74	Balaenoptera physalus	1
75	Balaenoptera musculus	1
77	unid. dolphin	2
78	unid. small whale	1
98	unid. whale	1
	TOTAL	33

Biopsies (Gary Friedrichsen, Laura Morse, Kathy Hough, and Rich Pagen)

Species	18 - 23 Nov	CSCAPE cumulative
Minke whale	0	1
Humpback whale	0	27
Blue whale	0	8
Fin whale	0	2
Sperm whale	0	11
Baird’s beaked whale	0	2
Short-beaked common dolphin	65	222
Pacific white-sided dolphin	0	25
Northern right whale dolphin	0	14
Striped dolphin	0	2
Dall’s porpoise	0	16
Killer whale	0	5
Risso’s dolphin	0	4
All species	65	339

“Frozen Zoo” Project/Cell-culture report (Laura Morse)

Species	24 - 30 Nov	CSCAPE cumulative
Blue whale		1
Baird’s beaked whale		1
Pacific white-sided dolphin		1
Striped dolphin		1
Dall’s porpoise		1
Northern right whale dolphin		1
Humpback whale		1
All Species		7

Photo-Project (Cornelia Oedekoven, Holly Fearnbach, and Kathy Hough)

Blue whale: 1 ID
Short-beaked common dolphins: 10 schools
Short-beaked common/striped dolphins: 4 schools
Risso’s dolphins: 1 school

The highlight of this week’s photo-effort was once again a small boat launch for Risso’s dolphins – our Thanksgiving treat. Other than that, we were surrounded by short-beaked common dolphins in large numbers. A few of the schools had striped dolphins mixed in and some of them even came to the bow. As this is not news for the dedicated weekly-report reader, and there really is not much exciting news from this week, we decided to delve deeper into a subject we discussed previously: the ‘dark-morphed’ short-beaked common dolphins. For those who are new to the weekly-world: the dark-morphed individuals lack the secondary cape and hence have no thoracic patch on the side.

We obtained pictures of six new individuals of this color morph this week, bringing our collection to a total of 35 different individuals for the cruise. Looking closer at their pictures, one can detect three basic types of variation among dark morphs. In the picture below, dolphin A is an example of very dark coloration; in particular, the cape, dorsal fin, beak-to-flipper stripe, and parts of the beak are black, producing a sharp contrast to the white belly. The eye-to-anus stripe is generally black as well. Dolphin B is typical of a dark morph with a muted, gray coloration to the cape. Dark morphs of this type show less overall contrast as the beak-to-flipper stripe and the eye-to-anus stripe are either the same muted gray as the cape or of tan coloration. These differences in color pattern between dolphin A and B generally mimic the variation in regular morphs of short-beaked common dolphins in our study area. Specifically, we generally find both darker and lighter animals within a school. Dolphin C shows an interesting case of a dark morph in which the secondary cape seems to be present but is very opaque, and you can almost see the outline of the thoracic patch. In addition, there are many marks in that area resembling scratches in the dark cape that reveal the underlying tan color. It is unlikely that these marks actually are scratches because they are consistently found only in the area where the thoracic patch would occur in a regularly morphed individual.

Three ‘dark-morphed’ short-beaked common dolphins showing variations within this anomalous color pattern – see text for details (photos: various artists).

Seabird Report (Rich Pagen and Thomas Staudt)

Some quiet days this week in the distant SW hinterlands of the study area. The tranquil seas and the unfamiliar high longitude numbers prompted the following questions among many of us: “Where the heck are we? What is this place?” The answer at one point was 450 miles west of the exact location where this ship will, in just under a week’s time, cross the CSCAPE finish line and where our shoes will once again get dirt stuck in their treads: the small, sleepy pueblo of San Diego.

We totaled 18 species this week, but averaged only 7 species per day. The paucity of sightings and the low species diversity were reflected in the fact that several different two hour shifts passed without a single bird in the survey zone, and that Thomas set a new CSCAPE record for the most data entries of the same species in a row: 21 entries of Red Phalaropes, one after the other, over a twenty-eight minute period. With that said, one could hardly tire of being in the presence of the birds that we did see in these remote and seldom-surveyed waters.

The title for most common bird out here goes to Leach’s Storm-Petrel, time and again. That such a small bird can not only survive but thrive in such a patchy environment where high winds and rough seas are its regular companions is nothing short of remarkable. Equally impressive to behold was the Red-tailed Tropicbird that paid us a visit during a small boat launch on Risso’s Dolphins. After days of flapping its way across seemingly endless stretches of featureless ocean (well, featureless to us birders – the tropicbird and the oceanographers would probably beg to differ), a massive white ship and a smaller orange inflatable boat zipping around a pod of dolphins must have been a rather odd sight to happen upon.

Out in these far-away waters, where low sighting rates can cause time on the flying bridge to come to a grinding halt, hopes and dreams of gadfly petrels (genus *Pterodroma*) are often the citrus fruits that hold back the approaching scurvy of tedious monotony. And this week, like the last, a couple oranges fell from the tree: two Mottled Petrels. As one of the Mottled Petrels spied something of interest and sat down on the water to pick at it, a question came to mind: how long had this particular individual been flying, searching, and scanning the surface of the sea before it fortuitously crossed paths with this tidbit of food? The patchiness of life out here is as much a fact of life for us observers as it is for the birds. And just as we, in the hopes of seeing something truly amazing, put in as much time on the flying bridge as we can muster, nearly all of the birds that meandered through our survey zone this week (Northern Fulmars, Black-footed Albatross and Laysan Albatross among others) were out on their beat, putting in their time, hoping to stumble across one of those enigmatic patches.

We are looking forward to one final week out here on CSCAPE, and crossing our fingers that time will be plentiful enough to allow us to survey near the northern Channel Islands. Tune in for the grand finale, the last chapter, next week!

Oh, I almost forgot – another interesting sighting this week, on Thanksgiving Day – see photo below…

One of the week's highlights was a Wild Turkey (which had apparently eaten its starboard wing) in with a mixed feeding flock. Also part of the same flock was Laura's long lost observer book pencil, the short November days evidently having triggered its migration instinct. Unusual was the flying bottle of wine (a species sadly extirpated from the CSCAPE study area), which caused unbridled excitement among crew and scientist alike – nearly everyone aboard was lining the railing to catch a glance of this rare species (not to mention the turkey). Photo: Rich Pagen and Cornelia Oedekoven – heehee!

PS: Jim, I guess the game is on!

<u>Oceanographic Operations (Candice Hall & Liz Zele)</u>

All is well in the land of the Hydro-girls, our new superhero nickname (thank the engineers!!). We've had some interesting CTD and XBT traces lately, with an incredibly well defined surface mixed layer.

Oceanographers refer to the surface layer with uniform hydrographic properties as the surface mixed layer. This layer is an essential element of heat (thermo) and freshwater (haline) transfer between the atmosphere and the ocean. It usually occupies the uppermost 50 - 150m; this range

varies seasonally. In the winter, surface mixing is driven by both wind waves and convection, which is produced by cooling of the sea surface. In the spring and summer, mixing is driven exclusively by wind waves. Consequently, the mixed layer is usually much deeper in the winter.

Storms over the past few months have given us plenty of wind waves and cooling temperatures, producing a 70m-plus mixed layer in some of our recent traces. The first trace to reveal the deep surface mixed layer occurred in conjunction with a day of multiple animal sightings. Sadly our sighting rate has since decreased. This change in sighting rate leads me to believe that although the nutrients are reaching the surface, there is little primary production taking place. Our small Bongo sample size appears to corroborate this hypothesis. We are currently stuck in fog; hopefully it will lift and allow us to test this productivity theory of mine to a greater degree.

Quote for the week: "How inappropriate to call this planet Earth, when clearly it is Ocean" (Arthur C. Clark – Fire in the Turtle House, 2001).

Date	CTD's	XBT's	Bongo Tows	Comments
11/24	2	3	1	Happy Thanksgiving!
11/25	1	3	1	
11/26	1	2	0	Weather
11/27	2	3	1	
11/28	2	3	1	
11/29	2	2	1	XBT connection issue
11/30	1	3	1	

Squeakly Report (Liz Zele and Laura Morse)

Other than the few fleeting groups of *Delphinus* who graced us with their presence during the earlier part of this week, acoustics has been uneventful. Hopefully next week will give us more than packing to look forward to!